REMARKS/ARGUMENTS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1-35 are presently active. Claims 1, 12, 14, 24, and 26 have been presently amended. No new matter was added.

In the outstanding Office Action, Claims 1, 6-8, 11, 14, 19-21, 26-28, and 30-35 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Tse (U.S. Pat. No. 6,198,845) in view of Koga et al (U.S. Pat. No. 5,388,167). Claims 2-3 and 15-16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Tse and Koga et al in view of Shirasawa (U.S. Pat. No. 5,689,590). Claims 4-5, 9-10, 17-18, 22-23, and 29 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Tse and Koga et al in view of Kamo (U.S. Pat. No. 5,465,160). Claims 12-13 and 24-25 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Tse and Koga et al in view of Mortimore (U.S. Pat. No. 5,740,428). Claims 27-30 and 34-36 were indicated as being allowed.

Firstly, Applicant acknowledges with appreciation the courtesy of Examiner Thompson to conduct an interview for this case on July 19, 2007 during which time the issues in the outstanding Office Action were discussed as substantially summarized hereinafter.

Secondly, Claim 1 as presently clarified defines a device for scanning a document which includes:

> a photoelectric conversion unit which scans a document and supplies image data of the scanned document,
> a background detecting unit which detects a background level of the image data so as to produce original background level value data that is separate from and not part of the image data and indicative of the background level,
> an image processing unit which applies one or more types of image processing to the image data, and applies image processing identical to the one or more types of image processing to the original background level value data to produce ***image processed modified background level value data***, and
> a background removal unit which generates ***a threshold derived from***

> ***the image processed modified background level value data***, and which utilizes said generated threshold to remove background noise from the image processed data.
>
> Thus, the device of Claim 1 is configured to:
>
> 1) determine original background level value data,
> 2) apply image processing to the background level data to produce a image processed modified background level data,
> 3) generate a threshold derived from the image processed modified background level value data, and
> 4) utilize the generated threshold to remove background noise from the image processed data.

Hence, Claim 1 defines a threshold derived from modified background level data that has been subject to the same image processing as the image data.

As discussed during the interview, the Office Action considers Tse to teach applying identical processing to both original background level values and image data. The Office Action only relies on Koga for a teaching of original background data that is separate from and not a part of image data. See Office Action, page 3, lines 5-6. The Office Action on page 4 states with regard to Tse's deriving a modified background level value that:

> The image processing unit applies dynamic range modification to the image using the image background gray level (BKG) ***previously determined*** (column 6, line 56 to column 7, line 4 of Tse). The dynamic range is modified such that all pixels with gray levels greater than the background gray level are saturated white (column 7, lines 18-30 of Tse). Thus, when the background removal unit produces the output values of the input image (column 8, line 67 to column 9, line 2 of Tse), the background noise is removed. Additionally, the threshold value (figure 10b("196") of Tse) is based on the gray level determined ***such that, above said gray level, the pixel value is set to whitest-white.*** Said gray level is different from the original background level value data ***and is used in setting the background level for the modified image. Thus, said threshold level is based on the modified background level value data.*** [Emphasis added.]

Hence, one issue for resolution is whether or not Tse teaches generating a threshold derived from image processed modified background level value data, and utilizing the generated threshold to remove background noise from the image processed data.

Following the examiner's analysis above, Tse derives a modified background level

value data from a previously determined image background gray level (BKG). The image background gray level (BKG) is determined based on the original image data as seen from equation (10) of Tse and is ***not based*** on image processed background pixels. Tse then shows by way of Figures 10A, 10B, and 10C the effect of processing using equations (17), (18), and (19), respectively. Applicant invites the examiner's attention to the explicit use of predetermined background BKG in equations (18) and (19).

In the examiner's analysis of Tse with regard to Figures 10A, 10B, and 10C, the image background gray level (BKG) value is 178. The examiner asserts that the threshold value (figure 10b("196") of Tse) is based on the gray level determined such that, above said gray level, the pixel value is set to whitest-white. However, the value "196" appearing in Figure 10b is ***not*** an image processed modification of the original background value 178, rather the value "196" represents as disclosed by Tse the number of grey levels (i.e., "21 grey-levels (R_{max} – 196) in the highlight region") that will be saturated white by the second preferred method. Indeed, Figure 10B of Tse still designates 178 as the BKG value, as do all Figures 10A, 10B, and 10C. Tse specifically states at col. 7, lines 26-30, that:

> The second preferred method maps more dark inputs grey pixels to the output, so more shadow detail will be visible. However, 21 grey-levels (R_{max} – 196) in the highlight region will be saturated white. This may result in some visible, saturated white areas in the resultant image.

Thus, the value "196" merely represents the number of grey levels that have been shifted into saturation, and does not represent an image processed modification of the BKG value 178 of Tse.

Thereafter, Tse discusses Figure 10C and states that:

> If the "white" term in Equation 18 is changed to "255" or the maximum possible output grey-level range, the transformation becomes a shift and linear stretch between R_{min} and the image background. This is illustrated in FIG. 10C. Thus, all pixels having grey levels above the image background level will be saturated white. This will also map more dark input grey-levels to the available range, but fewer light input grey-levels.

Once again, Figure 10C of Tse still designates 178 as the BKG value, as do all Figures 10A, 10B, and 10C.

Thus, while there is a shift in the number of grey-levels in Tse which are saturated white depending on which processing routine from equations (17), (18), and (19) are used, the designated background value "178" remains the same and is the basis in Figures 10B and 10C for determining how many of the grey-level values are to be saturated white.

While some of the pixels (which may be background pixels) in Tse are changed due to the image processing, there is no teaching in Tse, following the image processing (i.e., following the execution of the processing routines from equations (17), (18), and (19) and producing the images seen in Figures 11B, 11C, and 11D, respectively), that a threshold is derived from any of the background pixels in Tse's Figures 11B, 11C, and 11D, and no teaching that based on such a derived threshold would be used to subsequently remove noise from the images in Figures 11B, 11C, and 11D.

Thus, even if the teachings of Koga were combined with Tse and, for the sake of argument, even if this combination suggested that the background data should be separated from the image data, the combination of Tse and Koga would still not produce the claimed inventions, as there would be no teaching in the claimed combination for using the background pixels in the images of seen in Figures 11B, 11C, and 11D (i.e., the imaged processed background pixels) to derive a threshold by which noise in Figures 11B, 11C, and 11D would be removed.

Considered from another perspective, for Tse to have disclosed the invention of Claim 1, Tse would have had to teach a subsequent step in which selected background pixels in the processed images of Figures 11A-11D were identified as modified background pixels, whose background values would then be used to determine a threshold for background noise removal.

This step and determination is **not** taught in Tse.

Hence, Applicant respectfully submits that Tse (and Koga) fails to disclose or suggest generating a threshold derived from image processed modified background level value data, and utilizing the generated threshold to remove background noise from the image processed data.

Hence, Claim 1 and for similar reasons independent Claims (and the claims dependent therefrom) are believed to define over the applied art.

Further, dependent Claims 31-35 presently define appending, ***in a same data file for subsequent processing with the image data***, the original background level value data to the image data ***in a part of the data file concatenated from the image data***. The Office Action asserts that Koga et al's teaching in reference to Figure 2D and in reference to column 9, line 61, to column 10, line 11, constitutes such a disclosure and apparently associates the template image file with a concatenated data file containing the original background level value data. Yet, the template image in Koga et al as explained at column 3, lines 57-60, is an image of a blank standard document. Its image data (while perhaps indirectly related) does not constitute original background level value data from a scanned document. Thus, Koga et al's discussion at column 9, line 61, to column 10, line 11, seems irrelevant to appending, in a same data file for subsequent processing with the image data, the original background level value data to the image data in a part of the data file concatenated from the image data, as defined in Claims 31-35.

To meet the requirements of Claims 31-35, Koga et al would have to show or disclose the background values of Figure 2D (reproduced below) in a file concatenated but separate from the image data of Figure 2C (reproduced below). There is no such showing in Koga et al.

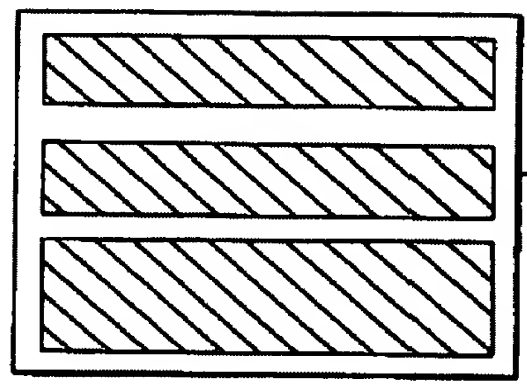

FIG 2D

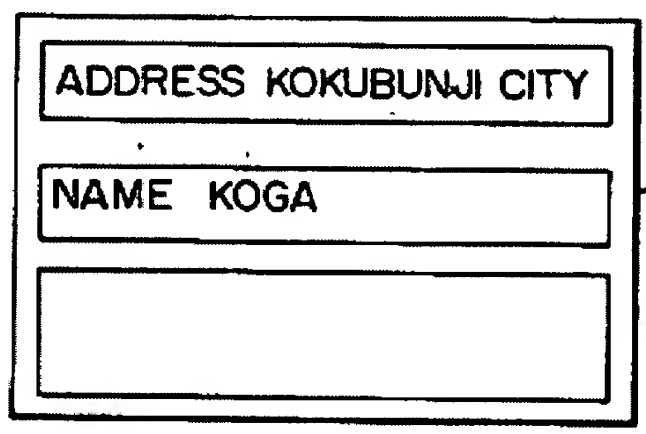

FIG. 2C

Thus, a combination of Koga et al with Tse would not produce the inventions defined in Claims 31-35.

Consequently, in light of the above discussions, the outstanding grounds for rejection are believed to have been overcome. The application as amended herewith is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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